REMARKS

Claims 1-34 are pending in the application. Claims 16-34 are withdrawn from consideration. Claims 1-15 are rejected.

In the Office Action, the Examiner rejected claims 1-6, 8-11, and 13-15 pursuant to 35 U.S.C. §103(a) as being unpatentable over Scheib et al. (U.S. Patent No. 5,682,896) in view of Schimpf et al. (U.S. Patent No. 6,784,894). Claims 7 and 12 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Scheib et al. in view of Schimpf et al., and further in view of Pan et al. (U.S. Patent No. 6,464,641). Applicants respectfully request reconsideration of the rejections of claims 1-15, including independent claims 1 and 10.

Independent claim 1 recites a graphics processing unit operable to process ultrasound data and with at least one output connected with a processor operable to process ultrasound data output by the graphics processing unit.

Scheib et al. show a graphics processor connected with a video processor that then connects to a display (Col. 2, lines 56-64). The graphics processor disclosed in Scheib et al. likely generates text, icons or graphs, not the operations of a graphics processing unit. The graphics processor of Scheib et al. is not a graphics processing unit. Graphics processing units include or are the video processor. Schimpf et al. also indicate that the video processor is part of the graphics processing unit. The Examiner relies on Schimpf et al. to show the components (fragment or vertex processors) of a graphics processing unit. Schimpf et al. show that the graphics processing unit includes the video output processor 24 (Col. 5, lines 35-45). If a person of ordinary skill in the art had used the graphics system of Schimpf et al. for the graphics processor of Scheib et al, the video processor of Scheib et al. would have been included in the graphics system and not a separate component. The use of teachings alleged by the Examiner would have resulted in no further processor connected with an output of the graphics processing unit to process output ultrasound data as recited by claim 1.

Independent claim 10 recites processing ultrasound data with a processor of a graphics processing unit, processing the ultrasound data output by the graphics processing unit with a different processor connected to the graphics processing unit prior to generating a display and generating a display. Because graphics processing units include a video processor as shown by

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Schimpf et al., there would not have been a different processor connected with the output of the graphics processing unit to process output data. Scheib et al. use the graphics processor and video processor for generating a display from already processed data (see the separate Transmitter Receiver 102, RF processor 103, Flow and Doppler processors 104 and 106, and the scan converter 108). Applicants respectfully submit that there is no suggestion to process with a graphics processing unit (GPU) and then further process the output of the GPU.

Dependent claims 2-6, 8-9, 11 and 13-15 depend from the independent claims 1 and 10 discussed above, and are thus allowable for at least the same reasons. The dependent claims are allowable for other reasons as well. For example, claim 3 recites an output upstream from the fragment processor where the output is from the GPU and connects with a processor. The Examiner does not cite to a showing by Schimpf of the claimed output from the GPU. Schimpf et al. show connections internal to the graphics system. As another example, claim 5 claims two outputs of the GPU, one to a processor and one to a display. Scheib et al. suggest connection to the display, not another processor. There is no suggestion to use two outputs. As yet another example, claims 8 and 13 recite the vertex processor operable to perform a scan conversion operation. Schimpf et al. show that the vertex processor receives vertices on screen space coordinates (Col. 10, lines 28-32). There is no disclosure of using the vertex processor to reformat data from one coordinate system to another. In another example, claims 9 and 15 recite the fragment processor operable to perform a Fourier transform or a non-linear scan conversion operation. The Examiner alleges these operations are well known and used in graphics arts. However, these processes are not usual processes done by a fragment processor. These are image processes in ultrasound typically performed by ASICs or DSPs. It would not have been obvious to perform these processes with a fragment processor. As yet another example, there is no suggestion for the fragment processor to be operable to scan convert as claimed in claim 14.

Dependent claims 7 and 12 recite different ultrasound processes performed by the graphics processing unit and the processor connected to the output. Pan et al. are relied upon to show the ultrasound path beginning at the beamformer. The transmitter and receiver of Scheib et al. is also a beamformer. Both Scheib et al. and Pan et al. use separate components for the various ultrasound processing components. The graphics processors generate graphics symbols (Pan et al. Col. 5, lines

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55-59). The video processor maps data to display data and combines information (Col. 5, lines 6-12, 27-31 and 50-55). There is no suggestion to use the video processor or a graphics processing unit for any of the claimed functions. Pan et al. and Scheib et al. use a video processor for video processes and diffcrent components for ultrasound processes.

CONCLUSION

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully rcquested to call the undersigned at (650) 943-7350 or Craig Summerfield at (312) 321-4726.

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